

REMARKS

The Final Office Action mailed June 5, 2003, has been received and reviewed. Claims 1 through 5, and 7 through 13 are currently pending in the application. Claims 1 through 5, and 7 through 13 stand rejected. Applicants propose to amend claims 1, 4, 5 and 11, and respectfully request reconsideration of the application as proposed to be amended herein.

Preliminary Amendment

Applicants' undersigned attorney notes the filing herein of a Preliminary Amendment on February 13, 2002, which filing was not acknowledged in the outstanding Office Action. Should the Preliminary Amendment have failed for some reason to have been entered in the Office file, Applicants' undersigned attorney will be happy to have a true copy thereof hand-delivered to the Examiner.

35 U.S.C. § 112 Claim Rejections

Claims 1 through 5, and 7 through 13 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. Applicants respectfully traverse this rejection, as hereinafter set forth.

The Examiner states that the format of claim 1 regarding the language "a first, nonheated section and a second, heated section" is indefinite because it implies that there is a first, *heated* section. While Applicants believe that such language is clear to indicate that the heating device comprises a first section, which is nonheated, and a second section, which is heated, Applicants propose to amend claim 1 to remove the references to "first" and "second" sections and thereby eliminate any perceived ambiguity regarding such language.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on U.S. Patent No. 6,056,823 to Sajoto et al. in view of U.S. Patent No. 4,638,150 to Whitney

Claims 1 through 5, and 7 through 13 stand rejected under 35 U.S.C. § 103(a) as being

unpatentable over Sajoto et al. (U.S. Patent No. 6,056,823) in view of Whitney (U.S. Patent No. 4,638,150). Applicants respectfully traverse this rejection, as hereinafter set forth.

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, **the prior art reference (or references when combined) must teach or suggest all the claim limitations.** The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (Emphasis added).

The 35 U.S.C. § 103(a) obviousness rejections of claims 1 through 5, and 7 through 13 are improper because the references relied upon by the Examiner fail to teach or suggest all of the limitations of the presently claimed invention and, furthermore, because there is a lack of motivation to combine the references in the manner suggested by the Examiner.

Independent claim 1, as proposed to be amended herein, is directed to a deposition chamber. The deposition chamber comprises: a chamber body having a cavity formed therein; a chamber lid configured to enclose the cavity; a vapor delivery head positioned within the cavity; a feedthrough device positioned in the chamber body, the feedthrough device having a longitudinal body portion and being configured to receive vapor from a vapor source and transfer the vapor therethrough along a pathway toward the vapor delivery head; a heating device including at least one resistor element having at least a portion thereof disposed within a thermally conductive sheathing, the heating device including a nonheated section and a heated section, wherein at least a portion of the heated section is configured to conduct heat to the longitudinal body portion of the feedthrough device; *a layer of thermal insulation disposed between at least a portion of the thermally conductive sheathing of the heating device and the chamber body and substantially circumscribing the longitudinal body portion and the at least a portion of the thermally conductive sheathing*; and *a temperature sensing device disposed between the layer of insulation and the longitudinal body portion of the feedthrough device and configured to generate a signal representative of a temperature sensed thereby.* Applicants

respectfully submit that the references relied upon by the Examiner fail to teach or suggest all of the limitations as set forth in claim 1 of the presently claimed invention.

The Examiner cites Sajoto as teaching a chamber body having a cavity formed therein; a chamber lid configured to enclose the cavity; a vapor head positioned within the cavity; a feedthrough device having a longitudinal body portion positioned in the chamber body having a lumen defined therein and configured to receive vapor from a vapor source and transfer the vapor therethrough along a pathway toward the vapor delivery head; a resistance heating device associated with the feedthrough device wherein at least a portion of the resistance heater is positioned within a continual helical groove of the feedthrough device. The Examiner then cites Whitney as teaching a flexible wire heater device including: electrical resistance leads having at least a portion thereof disposed within a stainless steel conductive sheathing; and “a thermocouple (‘PTC component 14’, ‘temperature-responsive component 14’; column 4, lines 54-68) positioned within the conductive sheathing to form a ‘self-limiting’ heater.” (Office Action, page 4; the Examiner cites, in a footnote, U.S. Patent 4,480,930 to DeZubay et al. as demonstrating that PTCs are thermocouples). The Examiner further cites Whitney as teaching a layer of thermal insulation (42, 44) disposed between a portion of the heated section (40) of the heating device; and “a temperature sensing device (‘PTC component 14’. ‘temperature-responsive component 14’; column 4, lines 54-68) positioned inside the layer of insulation. (Office Action, page 5).

However, Applicants submit that Sajoto and Whitney fail to teach or suggest all of the limitations of the presently claimed invention as set forth in claim 1. More specifically, claim 1, as proposed to be amended herein, includes a temperature sensing device *disposed between a layer of thermal insulation and a longitudinal body portion of the feedthrough device and configured to generate a signal representative of a temperature sensed thereby* wherein the layer of thermal insulation is disposed between the at least a portion of the thermally conductive sheathing of the heating device and the chamber body and substantially circumscribes the longitudinal body portion and the at least a portion of the thermally conductive sheathing.

Applicants note that, while the Examiner cites Whitney as teaching a layer of thermal insulation, such insulation (42, 44) is disposed internally of the sheathing and, thus, if combined

with Sajoto, would not substantially circumscribe the longitudinal body and the at least a portion of the thermally conductive sheathing as set forth in claim 1.

Furthermore, Applicants submit that the combination of Whitney and Sajoto does not result in a temperature sensing device being disposed between the recited layer of thermal insulation and longitudinal body portion of the feedthrough device which is configured to generate a signal upon sensing a temperature. Rather, Sajoto teaches that a “radiation shield 65 is disposed over the heater to prevent thermal radiation for heating the outer shell 41” (col. 6, lines 34-36), while, as shown in FIGS. 2 and 3A, a thermocouple (66) is disposed *external* to the radiation shield 65. In other words, Sajoto’s thermal radiation shield is disposed between the thermocouple and the heating device. Moreover, Applicants respectfully disagree with the Examiner’s position that the “PTC component 14” (also styled as “temperature-responsive component 14”) may be characterized as a temperature sensing device (or thermocouple) as set forth in the presently considered Final Office Action.

Rather, Whitney discloses a modular heater including a pair of elongate conductors and a plurality of rigid heating modules connected in parallel with each other between the conductors. The heating modules include “a temperature-responsive component 14 that has a positive temperature coefficient of resistance.” (Col. 4, lines 54-56). As further explained by Whitney, the temperature-responsive component “is thermally coupled to the heating component and ... has an electrical property which varies so that, when the heater is connected to the power supply, the heat generated by the module decreases substantially as the temperature of the module approaches an elevated temperature.” (Col. 2, lines 10-18). Furthermore, Whitney states that, for purposes of the Whitney disclosure, “a material is defined as having a ‘positive temperature coefficient of resistance’ if it increases in resistivity, in the temperature range of operation, sufficiently to render the heater self regulating.” (Col. 2, lines 25-29).

In other words, the heater taught by Whitney is self regulating because it incorporates, as part of its heating module, a material which exhibits a substantial change in resistance over a selected operating temperature range. Thus, as the resistance of the material changes, the heat produced by the heating module correspondingly changes. Such a device is markedly different from a temperature sensing device as set forth in claim 1 of the presently claimed invention.

Applicants note that the Examiner cites DeZubay as demonstrating “that PTCs are thermocouples (column 3, line 63).” (Office Action, fn 1; numbered paragraph 8). Applicants respectfully submit that DeZubay fails to make any connection between the PTC (positive thermal coefficient) components taught by Whitney and any type of thermocouple. Rather, DeZubay simply uses the same acronym, “PTC,” as shorthand for a “pulsed thermocouple concept.” (Col. 3, lines 63-64). According to DeZubay, the pulsed thermocouple (PCT) concept is used to analyze the transient behavior of an alternately heated and cooled body – in this case the thermocouple junction – to provide data which can be extrapolated to steady state conditions which would exist after indefinite thermocouple exposure.” (Col. 3, lines 64-68). The concept taught by DeZubay has essentially no relationship to the concept of a “positive thermal coefficient material” as taught by Whitney. Applicants, therefore, submit that the acronym “PTC” is clearly used by DeZubay in a different and unrelated context as compared to the use of the same acronym by Whitney.

Applicants further submit that there is a lack of motivation to combine Sajoto with Whitney in the manner suggested by the Examiner. Indeed, Applicants submit that Sajoto expressly teaches away from the presently claimed invention as set forth in claim 1. As noted above, Sajoto teaches that a thermal radiation shield is disposed over the heater to prevent thermal radiation for heating an associated outer shell while the thermocouple is disposed *external* to the thermal radiation shield relative to the heating device. (See, e.g., col. 6, lines 34-36; FIGS. 2 and 3A).

Applicants, therefore, respectfully submit that claim 1 is allowable over Sajoto and Whitney, either considered separately or in combination, and respectfully requests reconsideration thereof.

Applicant further submits that claims 2 through 5 and 7 through 13 are allowable as being dependent from an allowable base claim as well as for the additional patentable subject matter introduced thereby.

With respect to claim 8, Applicants submit that, contrary to the Examiner’s assertion, Sajoto and Whitney fail to teach or suggest a heater device having a temperature sensing device disposed within the thermally conductive sheath of the heating device. As noted above, the PTC

component 14 of Whitney is a self-limiting heater rather than a temperature sensing device as defined by the presently claimed invention.

With respect to claims 9 and 10, Applicants submit that Sajoto and Whitney fail to teach or suggest a thermocouple configured and located as set forth by the presently claimed invention.

While the Examiner has cited DeZubay as demonstrating that PTCs are thermocouples, as set forth above, the reference to a “PTC” by DeZubay is clearly inconsistent with the use of the same acronym by Whitney. As previously submitted, Applicants note that a basic thermocouple conventionally includes a pair of dissimilar metal components forming a junction therebetween to produce a temperature induced voltage. Regardless of a coincidence of similar acronyms, Whitney fails to disclose such a temperature sensing device as a thermocouple.

With respect to claim 10, Applicants further submit that Sajoto and Whitney fail to teach or suggest a thermocouple disposed within the thermally conductive sheathing.

With respect to claim 11, the Examiner views the limitation of at least a portion of the thermally conductive sheathing being “cold formed” into a helical pattern to be a product-by-process limitation. The examiner then states that Whitney shows a similar product (i.e., a thermally conductive sheathing) and, that under a product-by-process analysis, it doesn’t matter how the product was made, just that the product is disclosed.

While Applicants disagree with the Examiner’s assessment of claim 11 being a product-by-process claim, Applicants propose to amend claim 11 as set forth above herein. Applicants further submit that Sajoto and Whitney fail to teach or suggest that at least a portion of the thermally conductive sheathing is configured to maintain the heating device in a substantially helical pattern complementary with the continual helical groove.

With respect to claim 13, the Examiner states that it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Sajoto’s heater with Whitney’s heater by welding Whitney’s heater to Sajoto’s feedthrough device. However, Applicants submit that welding of Whitney’s device, with the associated localized application of intense heat, would pose a substantial risk of damaging the electrical circuits formed on the heaters (8) and thereby render the device of Whitney ineffective. Thus, one of ordinary skill in

the art would not be motivated to weld the device of Whitney to the feedthrough device of Sajoto.

Applicants, therefore, respectfully request reconsideration and allowance of claims 1 through 5 and 7 through 13.

ENTRY OF AMENDMENTS

The proposed amendments to claims 1, 4, 5 and 11, above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application. Further, Applicants submit that the amendments do not raise new issues or require a further search. Finally, if the Examiner determines that the amendments do not place the application in condition for allowance, entry is respectfully requested upon filing of a Notice of Appeal herein.

CONCLUSION

Claims 1 through 5 and 7 through 13 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Bradley B. Jensen", with a long horizontal flourish extending to the right.

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